
वस्त्रादि — बुने हुए ऊनी दस्ताने — विशिष्टि
(तीसरा पुनरीक्षण)

**Textiles — Gloves, Wool, Knitted —
Specification**
(Third Revision)

ICS 59.060.10, 59.080.30

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FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Hosiery Sectional Committee had been approved by the Textile Division Council.

Gloves are pieces of clothing which cover your hands and wrists and have individual sections for each finger. Gloves are worn to keep hands warm or dry or to protect them.

This standard, first published in 1969, and subsequently revised in 1976 and 1986. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

- a) Title of the standard has been modified;
- b) References to Indian Standard given in Annex A has been updated; and
- c) BIS Certification Marking Clause has been updated.

The composition of the committee responsible for the formulation of this standard is listed in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***TEXTILES — GLOVES, WOOL, KNITTED — SPECIFICATION***(Third Revision)***1 SCOPE**

1.1 This standard prescribes the constructional details and other particulars of knitted gloves, white, dyed or of mixture shades made from worsted yarn.

1.2 This standard does not prescribe general appearance, lustre, feel, type of finish, and shade of gloves (see also 4.5).

2 TERMINOLOGY

For the purpose of this standard, the definitions

given in IS 3596 shall apply.

3 MANUFACTURE**3.1 Yarn**

The yarn used for knitting gloves shall be spun on worsted system from wool only or blend of wool and nylon. The approximate count of yarn shall be 90 tex $\times$ 2 (Nm 1 1/2).

3.1.1 The particulars of yarn shall be as follows:

Sl No.	Fibre Composition		Fibre Length, mm	Grade of Wool Tops/Fineness of nylon	Single Thread Breaking Load N (g), Min
	Fibre	Percentage			
(1)	(2)	(3)	(4)	(5)	(6)
i)	Wool	100	80, Min	Not less than 48s (see Note)	6.0 (600)
ii)	Wool (dyed)	80	80, Min	Not less than 48s (see Note)	7.5 (750)
iii)	Nylon (dyed)	20	80 - 120	0.33 to 0.44 tex (3 to 4 denier)	
Method of Test, Ref to		—	IS 233 (Part 4)	IS 5911	IS 1670

NOTES

1 The breaking load of yarn shall be determined on a test length of 500 mm using a constant rate of traverse type machine having a traverse of (300 ± 15) mm per minute.

2 The breaking load values of yarn removed from the glove shall not be less than 95 percent of the specified values.

3.2 Gloves

The various portions of gloves shall be knitted as given below:

- a) Cuffs — 2×2 rib-knitted, seamless;
- b) Palm — Plain-knitted, seamless; and
- c) Fingers — Plain-knitted with sewing on one side.

3.2.1 The gloves shall be of the design as illustrated in Fig. 1 and shall be so knitted as to allow the use of the gloves on either hand irrespective of positioning of the thumb. The fingers shall be sewn neatly on the one side of the hand with the same yarn as used in knitting the gloves without leaving any opening at the finger tips. The tail end of the sewing thread shall be knotted securely without forming a big knot or causing tight fitting at the base of fingers. The seams shall be elastic and shall not give way when the knitted fabric is stretched in any direction to the full extent without breaking, or allowing the loops of the fabric to run.

3.2.2 The gloves shall be given shrink-resist treatment preferably at the yarn stage.

3.3 Freedom from Defects

The gloves shall be free from manufacturing defects such as large mends, ladders, dropped stitches, noticeable oil or other stains, holes, cuts, sewing defects, badly shaped fingers, chemical damages and dyeing defects such as uneven dyeing and streakiness or any other defect which may significantly mar the appearance or serviceability of the gloves.

4 REQUIREMENTS

4.1 Dimensions and Mass

The gloves shall conform to the requirements of Table 1 read with Fig. 1.

4.2 Wales and Courses

The number of wales and courses in the gloves shall conform to those given in Table 2.

4.3 The gloves shall also conform to the requirements as given in Table 3.

4.4 Fibre Composition

In case the yarn of 80 : 20 blend of wool and nylon is used in the manufacture of gloves, the same shall have wool content between 77 percent to 83 percent and the remainder being nylon. However, wool content up to 75 percent in an individual sample may be permitted if the average is within the specified limits.

4.4.1 Before conducting the chemical analysis, the fibres present in the yarn shall first be identified according to IS 667. The sample to be analyzed should be free from all added and non-fibrous impurities. The percentage of wool fibres in the basic knitted fabric shall be determined by IS 2006 and the percentage of nylon fibres by the following formula:

$$X = 100 - Y$$

where

X = percentage of nylon fibres; and

Y = percentage of wool fibres.

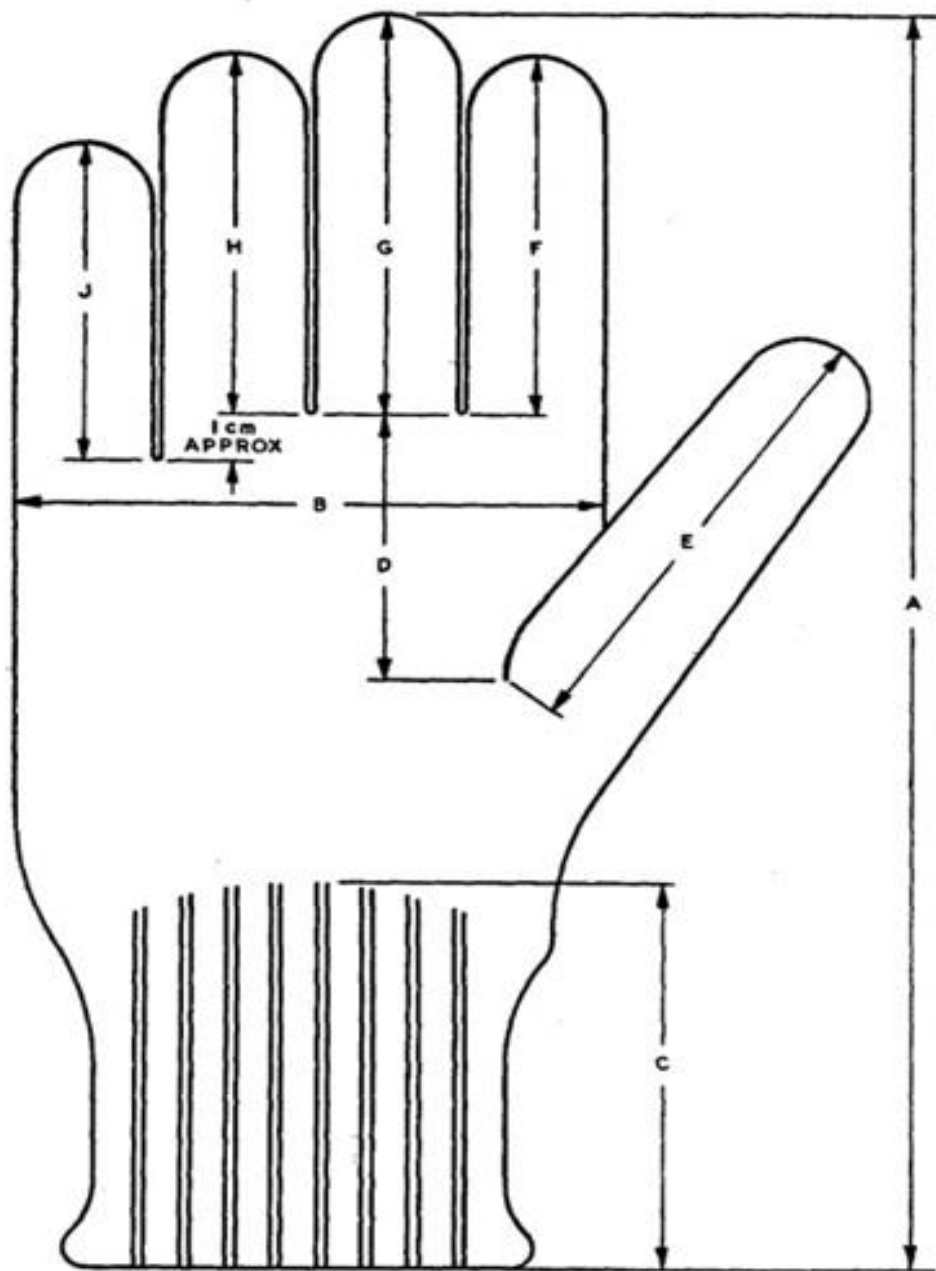


FIG. 1 GLOVE, KNITTED

Table 1 Dimensions and Mass of Gloves
(Clause 4.1 and Fig. 1) All dimensions in centimetres

SI No.	Size No.	Overall Length	Width Across Palm	Depth of Cuff	Distance of Thumb from Middle Finger	Length					Mass of 10 Pairs in Grams, <i>Min</i> (see Note)
						Thumb	Index Finger	Middle Finger	Ring Finger	Little Finger	
			A	B	C	D	E	F	G	H	J
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	0	24.0	10.0	6.0	4.0	9.5	6.5	7.0	6.5	5.0	600
ii)	1	25.0	11.0	7.0	5.0	10.0	7.0	7.5	7.0	5.5	760
iii)	2	26.0	11.0	7.0	5.75	10.5	7.5	8.0	7.5	6.0	820
iv)	3	27.0	12.0	7.0	5.75	11.0	8.0	8.5	8.0	6.5	900
v)	4	28.0	12.0	7.0	5.75	11.5	8.5	9.0	8.5	7.0	950
Tolerance		± 1.5	± 1.0	± 1.0	± 0.5						—
Method of Test, Ref to		B-2									B-3
NOTE — A tolerance of minus 5 percent shall be permissible on the mass of an individual pair calculated on the basis of the mass specified in col (12).											

Table 2 Number of Wales and Courses
(Clause 4.2)

Sl No.	Size No.	Total Number of Wales in the Glove	Minimum number of Wales in Each Finger					Course per dm
			Thumb	Index Finger	Middle Finger	Ring Finger	Little Finger	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	0	68	22	18	21	18	16	44 ± 2
ii)	1	72	23	19	22	19	16	
iii)	2	72	23	19	22	19	16	
iv)	3	76	24	21	23	21	18	
v)	4	76	24	21	23	21	18	
Method of Test, Ref to		B-4						B-5

Table 3 Requirements of Gloves
(Clause 4.3)

Sl No.	Characteristics	Requirement	Method of test
(1)	(2)	(3)	(4)
i)	Dimensional change (due to relaxation), percent, <i>Max</i>	2.5	B-6
ii)	Dimensional change (due to felting), percent, <i>Max</i>	5.0	B-7
iii)	pH value of aqueous extract	5.0 - 7.5	IS 1390
iv)	Scouring loss, percent, <i>Max</i>	4	B-8
v)	Colour fastness to:		
	a) Light, Change in colour	4 or better	IS/ISO 105-B01 or IS/ISO 105-B02
	b) Washing: Test B (2)		IS/ISO 105-C10
	1) Change in colour	4 or better	
	2) Staining of adjacent fabric	4 or better	
	c) Perspiration		IS/ISO 105-E04
	1) Change of colour	4 or better	
	2) Staining of adjacent fabric	4 or better	

4.5 Sealed Sample

If in order to illustrate or specify the undeterminable characteristics, such as general appearance, feel, shade and finish, a sample has been agreed upon and sealed, the supply shall be in conformity with the sealed sample in such respects.

4.5.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

5 PAIRING

5.1. The gloves shall be matched and paired according to their size (see Table 1) and shade. They shall be tucked together at the lower end of the cuff.

5.1.1 A difference of 1.0 cm in the overall length of the gloves shall, however, be permissible while pairing.

6 MARKING

6.1 Each pair of gloves shall be distinctly marked with the following:

- a) Size;
- b) Fibre composition (for instance, '100 percent wool' or 'Wool-80 percent, Nylon-20 percent');
- c) Manufacturer's name, initials or trade-mark, if any; and
- d) Any other information required by the buyer.

6.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

7 PRESERVATION

The gloves shall be preserved with naphthalene using a minimum quantity of 5 kg per cubic metre of the volume of bale.

8 PACKING

Unless otherwise agreed between the buyer and seller, the gloves of the same size and shade shall be packed in bales in accordance with IS 2518 or IS 3353 as the case may be.

9 SAMPLING

9.1 Lot

A consignment of gloves of the same size, colour and composition of fibres delivered to a buyer against a dispatch note shall constitute a lot.

9.1.1 The conformity of the lot to the requirements of this specification shall be determined on the basis of the tests carried out on the sample selected from it.

9.2 Unless otherwise agreed to between the buyer and the seller, the number of gloves, depending upon the size of the lot, shall be selected at random in accordance with col (3) of Table 4.

Table 4 Number of Gloves to Be Selected from a Lot and Permissible Number of Non-Conforming Gloves
(Clauses 9.2 and 9.3)

Sl No.	Numbers of Gloves in The Lot	Non-Destructive Testing		Destructive Testing	
		Number of Gloves to be Selected	Permissible Number of Non-Conforming Gloves	Number of Gloves to be Selected	Permissible Number of Non-Conforming Gloves
(1)	(2)	(3)	(4)	(5)	(6)
i)	Up to 300	10	1	2	0
ii)	301 to 500	20	1	3	0
iii)	501 to 1 000	30	2	5	0
iv)	1 001 to 3 000	50	3	8	0
v)	3 001 and above	80	5	13	1

9.3 The sample size and the criteria for conformity for various characteristics shall be as follows:

Sl No.	Characteristics	Sample Size	Criterion for Conformity
i)	Freedom from defects dimensions and number of wales and courses	All the gloves selected according to co1 (3) of Table 4	Non-conforming gloves not to exceed the corresponding number given in co1 (4) of Table 4
ii)	Mass	All the gloves selected according to co1 (3) of Table 4	Each observed value to satisfy the specified requirement
iii)	Fibre composition Specification for wool tops, dimensional change, scouring loss, pH value and colour fastness to various agencies except light	All the gloves selected according to co1 (5) of Table 4	Non-conforming gloves not to exceed the corresponding number given in co1 (6) of Table 4
iv)	Colour fastness to light	One in case of lot size of 500 gloves and two above that	Each glove to satisfy the specified requirement

ANNEX A
(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
IS 233 (Part 4) : 2020	Textiles — Methods for determination of length parameters of cotton fibres: Part 4 estimation of length, uniformity ratio and uniformity index by the optical scanning method (<i>second revision</i>)		certain other non-protein fibres (<i>second revision</i>)
		IS 3596 : 1967	Glossary of terms relating to hosiery
		IS 5911 : 1977	Fineness grades of wool tops (<i>first revision</i>)
IS 667 : 1981	Methods for identification of textile fibres (<i>first revision</i>)	IS/ISO 105-B01 : 2014	Textiles — Tests for colour fastness: Part B01 Colour fastness to light: Daylight
IS 1670 : 1991	Textiles — Determination of breaking load and elongation at break of single strand (<i>second revision</i>)	IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light: Xenon arc fading lamp test
IS 2006 : 1988	Method for quantitative chemical analysis of binary mixtures of protein fibre with certain other non-protein fibres (<i>second revision</i>)	IS/ISO 105-C10 : 2006	Textiles — Tests for colour fastness: Part C10 Colour fastness to washing with soap or soap and soda
IS 2518 : 1964	Code for seaworthy packaging of wool hosiery yarn and goods	IS/ISO 105-E04 : 2013	Method for determination of colour fastness of textile materials to perspiration (<i>first revision</i>)
IS 3353 : 1966	Code for inland packing of wool hosiery yarn and goods fibre with		

ANNEX B

(Tables 1, 2 and 3)

METHOD OF TEST

B-1 CONDITIONING OF TEST SPECIMENS AND ATMOSPHERIC CONDITIONS FOR TESTING

The test specimens shall preferably be conditioned for testing and tested in the standard atmosphere as given in IS 6359.

B-2 DIMENSIONS

Take a glove from the test sample. Lay it flat on a horizontal surface. Remove all creases and wrinkles without distorting it. Measures correct to the nearest millimetre the dimensions given in Table 1.

B-3 MASS

Take a set of 10 pairs of gloves from the test sample. Condition them to moisture equilibrium for 24 hours (see A-1.1) and weigh to an accuracy of 10 g.

B-4 WALES

Take a glove constituting the test sample. Lay it flat on a horizontal surface. Remove all creases and wrinkles without distorting it. Count with the help of a pick glass or magnifying glass, the number of wales per decimetre at the required portion of the glove.

B-5 COURSES

Take a glove constituting the test sample. Lay it flat on a horizontal surface. Remove all creases and wrinkles without distorting it. Count with the help of a pick glass or magnifying glass, the number of courses per decimetre.

B-6 DIMENSIONAL CHANGE (DUE TO RELAXATION)

B-6.1 Marking of Test Specimens

Take a glove from the test sample. Mark centrally on it by means of indelible ink or a fast dyed cotton sewing thread an area 15 cm × 15 cm with two of its sides running in the direction of wales and the other two in the direction of courses. Spread this test specimen on a flat smooth surface, carefully removing by hand all creases and wrinkles. Within this area, mark six pairs of marks, three pairs each in

the direction of wales and courses in such a way that the distance between each pair of marks- is the same.

B-6.2 Procedure

B-6.2.1 Place test specimen on a glass plate and carefully remove by hand all creases and wrinkles without stretching the test specimen and place another glass plate on the test specimen. Measures correct to the nearest millimetre the distance between each pair of marks separately.

B-6.2.2 Lay the test specimen flat in a tray of suitable size and soak the specimen under a head of 25 mm of water containing 0.5 percent suitable wetting agent at room temperature for 2 hours. Drain out the water and remove the test specimen carefully so that it is not stretched. Lay the specimen flat on a smooth surface. Remove the excess water with the help of an absorbent material or by keeping the smooth surface in a sloping position. Dry the specimen at room temperature.

NOTE — Removal of excess water by wringing the test specimen is not permitted.

B-6.2.3 Proceed as in B-6.2.1 and measure correct to the nearest millimetre the distance between each pair of marks separately. Preserve the specimen for B-7.1.1 for determining felting shrinkage.

B-6.3 Calculation

B-6.3.1 Calculate separately the percentage of dimensional change for each pair of marks in the directions of wales and courses by the following formula:

Dimensional change (due to relaxation), Percent

$$= \frac{a-b}{a} \times 100$$

where

- a The distance between a pair of marks (along the wales or courses as the case may be) before soaking; and
- b The distance between the same pair of marks after soaking.

B-6.3.2 Determine the average dimensional change (due to relaxation), percent in each direction.

B-7 DIMENSIONAL CHANGE (DUE TO FELTING)**B-7.1 Procedure**

B-7.1.1 This test is to be carried out on the same specimen (see **B-6.2.3**) for which the relaxation shrinkage has been determined. Soak it under a head of 25 mm of water containing 0.5 percent suitable wetting agent at 30 °C to 35 °C for overnight. Drain out the water and remove excess water from the test specimen by passing through rubber wringers or using hydroextractor so that the water retained is about 60 percent of air-dry mass of specimen.

B-7.1.2 Evenly wet the specimen with 5 percent soap solution corresponding to 25 percent air-dry mass of the specimen. This is conveniently done by spraying it with soap solution by means of a pipette or burette. Subject the specimen to 2 000 blows at the rate of 70 blows per minute in a suitable single hammer milling machine (see Note), taking care that those portions of the specimen received initial hammering which are least exposed to severe milling during actual use. Wash the specimen in distilled water. Dry and condition it to moisture equilibrium at room temperature. Measure the distance between the different pairs of marks as in **B-6.2.1**.

NOTE — The air-dry mass of a charge for the milling machine should be about 170 g. Accordingly, sufficient quantity of entirely unfelted woolen knitted goods may be added to form a charge.

B-7.2 Calculation

B-7.2.1 Calculate separately the percentage of dimensional change (due to felting) for each pair of marks in the direction of wales and courses by the following formula:

$$Sr = \frac{b-c}{b} \times 100$$

where

Sr = dimensional change (due to felting), percent;

b = the distance between a pair of marks

(along the wales and courses as the case may be) before milling as measured in **B-6.2.3**; and

c = the distance between the same pair of marks as noted in **B-7.1.2**.

B-7.2.2 Calculate the average dimensional change (due to felting) in each direction.

B-8 SCOURING LOSS**B-8.1 Test Specimen**

Cut the test specimen weighing about 10 g from each sample.

B-8.2 Procedure

B-8.2.1 Dry the test specimen to constant mass in the drying oven at (105 ± 3) °C temperature and determine its mass accurately.

NOTE — Constant mass shall be deemed to have been reached if the difference between the two successive weighing's at an interval of 20 minutes is less than 0.05 percent.

B-8.2.2 Extract the above specimen with a mixture of benzene and methyl alcohol in the proportion of 3 : 2 in a Soxhlet apparatus for 4 hours at the rate of 5 extractions per hour, by placing the specimen in a thimble and covering it with cotton or wool previously extracted with the above stated mixture of benzene and methyl alcohol. The solvent shall then be distilled off from the extract. Dry the residue to a constant mass (see Note under **B-8.2.1**) at (105 ± 3) °C and determine the mass accurately.

B-8.3 Calculation

Calculate the scouring loss by the following formula:

$$\text{Scouring loss, percent} = \frac{a}{b} \times 100$$

where

a = mass of the dry residue (see **B-8.2.2**); and

b = mass of the test specimen (see **B-8.2.1**).

ANNEX C
(Foreword)

COMMITTEE COMPOSITION

Hosiery Sectional Committee, TXD 10

<i>Organization</i>	<i>Representative(s)</i>
The South India Textile Research Association, Coimbatore	DR PRAKASH VASUDEVAN (Chairperson)
Apparel Export Promotion Council, Gurugram	SHRI K. S. BISHT
Central Reserve Police Force, New Delhi	SHRI SANJEEV KUMAR SINGH SHRI RANDHIR KUMAR JHA (<i>Alternate</i>)
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JKR Garments, Tirupur	SHRI JAILANI
Knitwear & Apparel Manufacturers Association, Ludhiana	SHRI SUDARSHAN KUMAR JAIN SHRI ARUN AGGARWAL (<i>Alternate</i>)
NIFT-TEA College of Knitwear Fashion, Tirupur	DR K. P. BALAKRISHNAN DR P. P. BALAKRISHNAN (<i>Alternate</i>)
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The Synthetic and Rayon Textiles Export Promotion Council, Mumbai	SHRI ANIL RAJVANSHI SHRI BHADRESH M. DHODIA (<i>Alternate</i>)
Tiruppur Exporters Association, Tiruppur	SHRI T. R. VIJAYKUMAR
Veermata Jijabai Technological Institute, Mumbai	SHRI S. P. BORKAR DR ARVIND BHONGADE (<i>Alternate</i>)

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